

More research, investigation needed into vehicle fires

By Len Garis, Chief, Surrey Fire Service & Darryl Plecas, Patrick Neal, and Niki Huitson, Centre for Criminal Justice Research, School of Criminology and Criminal Justice, University College of the Fraser Valley

A recent study in Surrey, British Columbia has contradicted national research on vehicle fires, demonstrating the need for further research and investigation on this topic.

Completed in July 2007 by the Centre for Criminal Justice Research at the University College of the Fraser Valley's School of Criminology and Criminal Justice, the study was initiated by Surrey Fire Service after the discovery that the number of vehicles involved in fires in Surrey was unusually high compared to national research and common expectations.

Indeed, a staggering 50% of all fires attended by Surrey Fire Service in the seven-year period between 1997 and 2003 involved a vehicle. Closer examination revealed that this figure was more than twice what would have been expected, and what is reflected in national research. For example, the Council of Canadian Fire Marshals and Fire Commissioners reported in 2004 that vehicle fires accounted for just 21% of calls received by Canadian fire departments in 2001.

Surrey's patterns also did not align with research showing a correlation between the incidence of vehicle fires and the time of day when vehicles are most in use, as was noted in the 2005 National Fire Protection Association report *U.S. Vehicle Fire Trends and Patterns*.

STUDY RESULTS

The database used for the analysis was provided by the Office of the Fire Commissioner for the Province of British Columbia, and contained information about the street location, date, time, and place of each incident, as well as the type of vehicle and amount of loss involved.

Time of Day of Vehicle Fires

Clearly, as Table 1 below shows, vehicle fires in Surrey are not occurring in a pattern consistent with vehicle use. Some 32% occur between 11 p.m. and 3 a.m., and if this is added to the 18% that occur between 3 a.m. and 7 a.m., it appears that half of all vehicle fires occur when vehicle use is undoubtedly at its lowest. This proved to be the case for each of the seven years considered.

Table 1: Time of Day of Vehicle Fires in Surrey, B.C. 1997 - 2003

Year	Number	Time Periods (per cent of total vehicles/time period)					
		11 p.m.-3 a.m.	3-7 a.m.	7-11 a.m.	11 a.m.-3 p.m.	3-7 p.m.	7-11 p.m.
1997	280	31	15	5	10	14	25
1998	362	29	14	9	14	15	20
1999	363	32	18	8	12	13	17
2000	397	34	16	7	11	13	19
2001	394	33	20	8	9	12	18
2002	422	32	20	5	10	16	17
2003	375	30	19	10	9	14	18
TOTAL	2,593	32	18	7	11	14	19

Age of Vehicles and Amount of Loss

It also turns out, as Table 2 below shows, that the newest and most expensive vehicles catch fire between 11 p.m. and 3 a.m. Further, newer and more expensive cars are catching fire between 3 a.m. and 7 a.m. than in the remaining time periods.

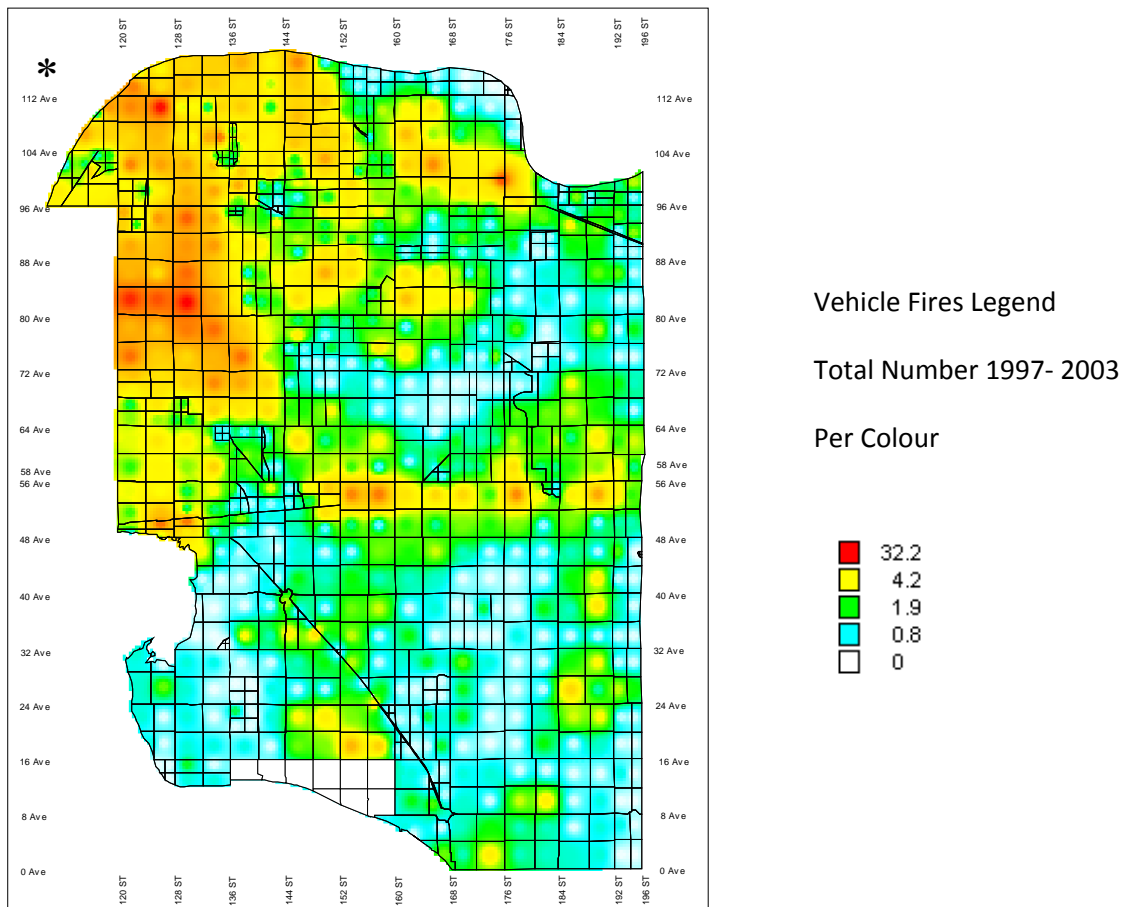
Table 2: Age of Vehicles and Loss Involved in Vehicle Fires in Surrey, B.C. 1997 - 2003

Time Period	Amount of \$ Loss	Age of Vehicle
11 p.m.-3 a.m.	7,493	10.5
3-7 a.m.	5,996	11.0
7-11 a.m.	5,496	13.2
11 a.m.-3 p.m.	5,861	13.3
3-7 p.m.	4,153	14.2
7-11 p.m.	5,473	12.2
TOTAL	6,068	11.9

Location of Vehicle Fires

Another surprise discovery was the presence of hotspots for vehicle fires in Surrey. As Figure 1 shows, Surrey has several hotspot areas – none of which are either the city's most densely populated areas or areas with the highest traffic volumes.

Figure 1: Vehicle Fire Hotspots in Surrey, B.C. 1997 - 2003



CONCLUSION

Data currently does not exist to determine if Surrey's vehicle fire patterns reflect what is happening elsewhere in Canada. However, it is easy to suppose that a significant number of the Surrey incidents are cases of arson given the occurrence hour blocks – supported by the 2005 NFPA report that found that intentionally set highway vehicle fires peak between midnight and 3 a.m.

Unfortunately, though, vehicle fires are not thoroughly investigated in Surrey or elsewhere, as noted in reports by the United States' Homeland Security in 2002 and Federal Bureau of Investigation in 2001. No doubt, part of the reason for this is that arson is very difficult to prove.

Still, given the significant draw on fire department resources by vehicle fires – and the questions about existing research that arise from the Surrey study – the issue certainly deserves more serious attention. A case can clearly be made for fire departments across the country to employ crime analysts to conduct further research into this topic, beginning with the nature and extent of vehicle fires in their jurisdictions. Further research is a necessary starting point for Canadian communities to develop strategies to reduce vehicle fires and their associated financial and social burden.